HEC-FDA Improvements

Ongoing Development

Jason Needham, P.E.

Hydrologic Engineering Center

What is our goal?

- Provide a tool to streamline the planning analysis processes
  1. Assist Corps' analysts in meeting regulations
  2. User-friendly product

How are we achieving our goal?

- Improving current tool (FDA 1.2 to FDA 1.3)
  - Minor data entry/reporting adjustments
  - Bug fixes
  - New user/applications guides
- Developing new GIS capabilities for data development, analysis, and a means of illustrating results (FDA 2.0)
  - Create structure inventories
  - Display and use flood inundation maps
  - Interactive capabilities

Achieving goals (cont.)

- Create a Comprehensive Flood Damage Analysis Package (FDA 2.0)
  - Plan comparison using risk analysis approach
  - Event damage and impacts
  - Project benefit accomplishments
  - Individual structure damage accounting
  - Incorporation of non-structural measure evaluation
  - Cost Benefit Analysis – NED
  - Structures and Population w/ uncertainty

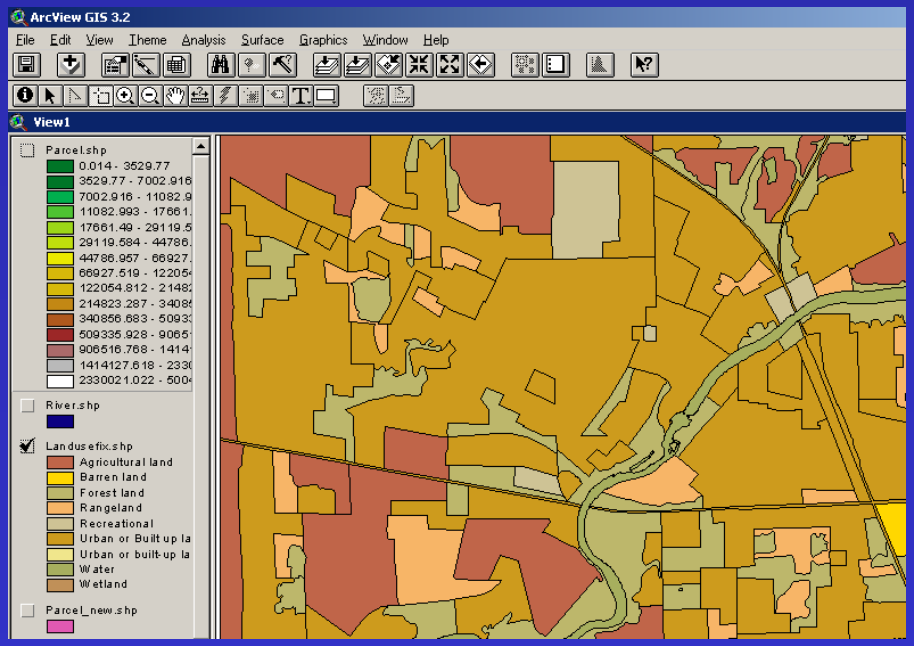
GIS capabilities for data developm

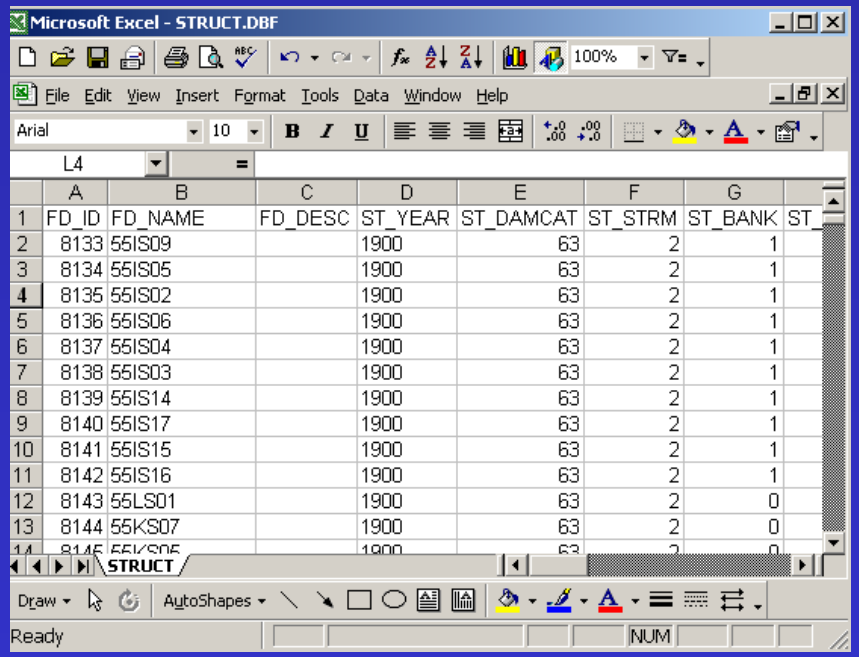
- Provide capability to generate approximate structural inventory for flood damage analysis from generally available shape files.
- Facilitate the estimation of flood damage for the future conditions of an undeveloped area.
- Generate stage-area relationships for crop damage calculations.

Structure inventory developmer

Generally Available Geospatial Information: Shape File and DEM's

Structure Inventory or Flood Damage Software





	A	B	C	D	E	F	G
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2	8133	55IS09		1900	63	2	1
3	8134	55IS05		1900	63	2	1
4	8135	55IS02		1900	63	2	1
5	8136	55IS06		1900	63	2	1
6	8137	55IS04		1900	63	2	1
7	8138	55IS03		1900	63	2	1
8	8139	55IS14		1900	63	2	1
9	8140	55IS17		1900	63	2	1
10	8141	55IS15		1900	63	2	1
11	8142	55IS16		1900	63	2	1
12	8143	55LS01		1900	63	2	0
13	8144	55KS07		1900	63	2	0

HEC-FDA - Proposal_Parcel

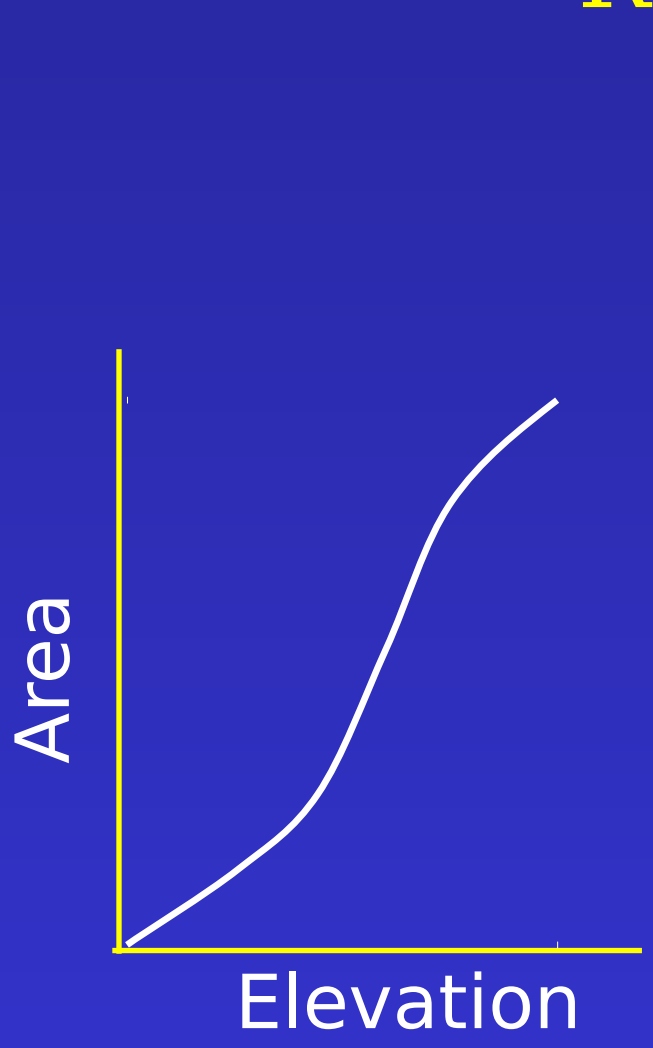
File Edit View Inventory Reports Tools Help

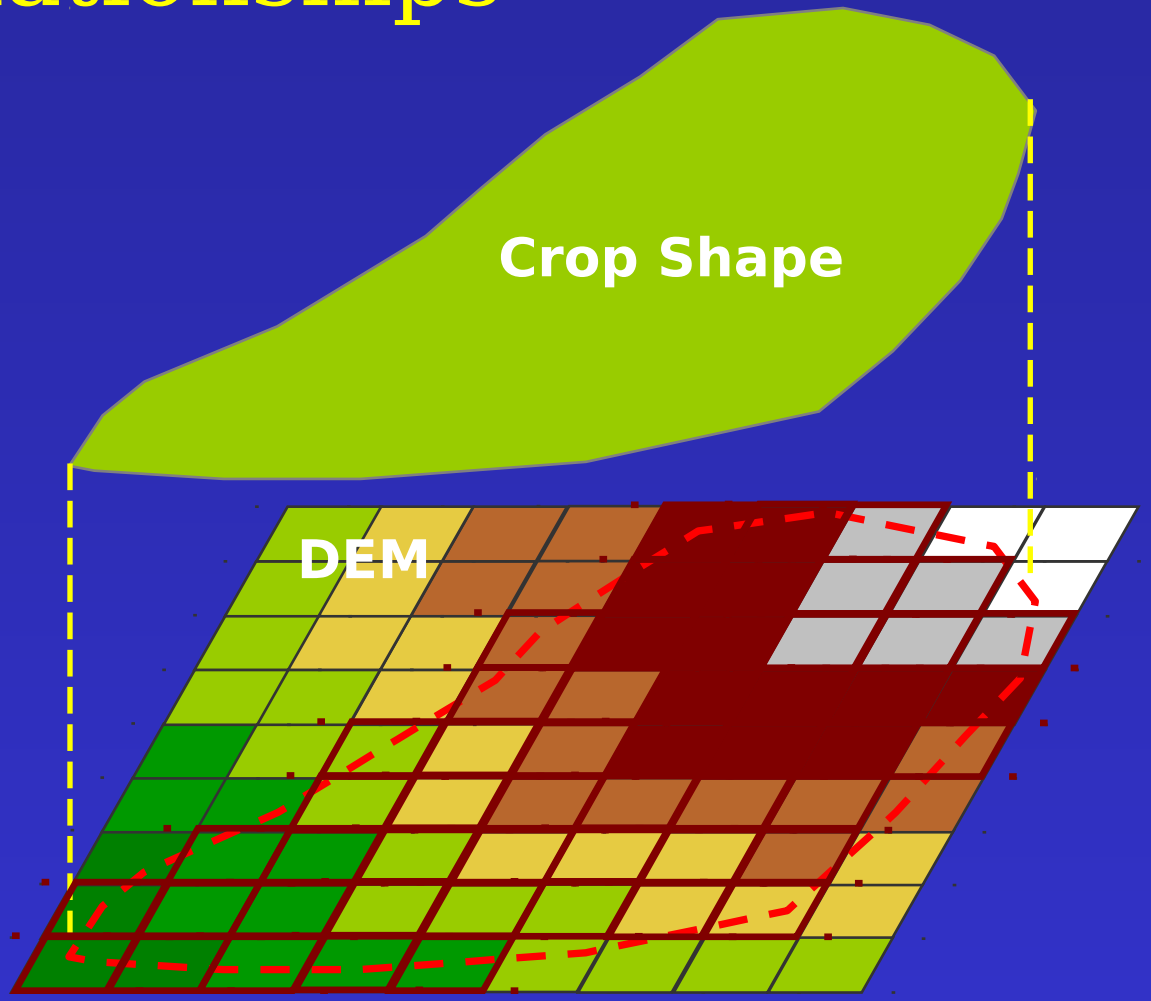
Module: Inventory Configuration Study

Coordinates: 13332105 east, 681843north

Map parcelx.shp loaded

Stage – Area Relationships



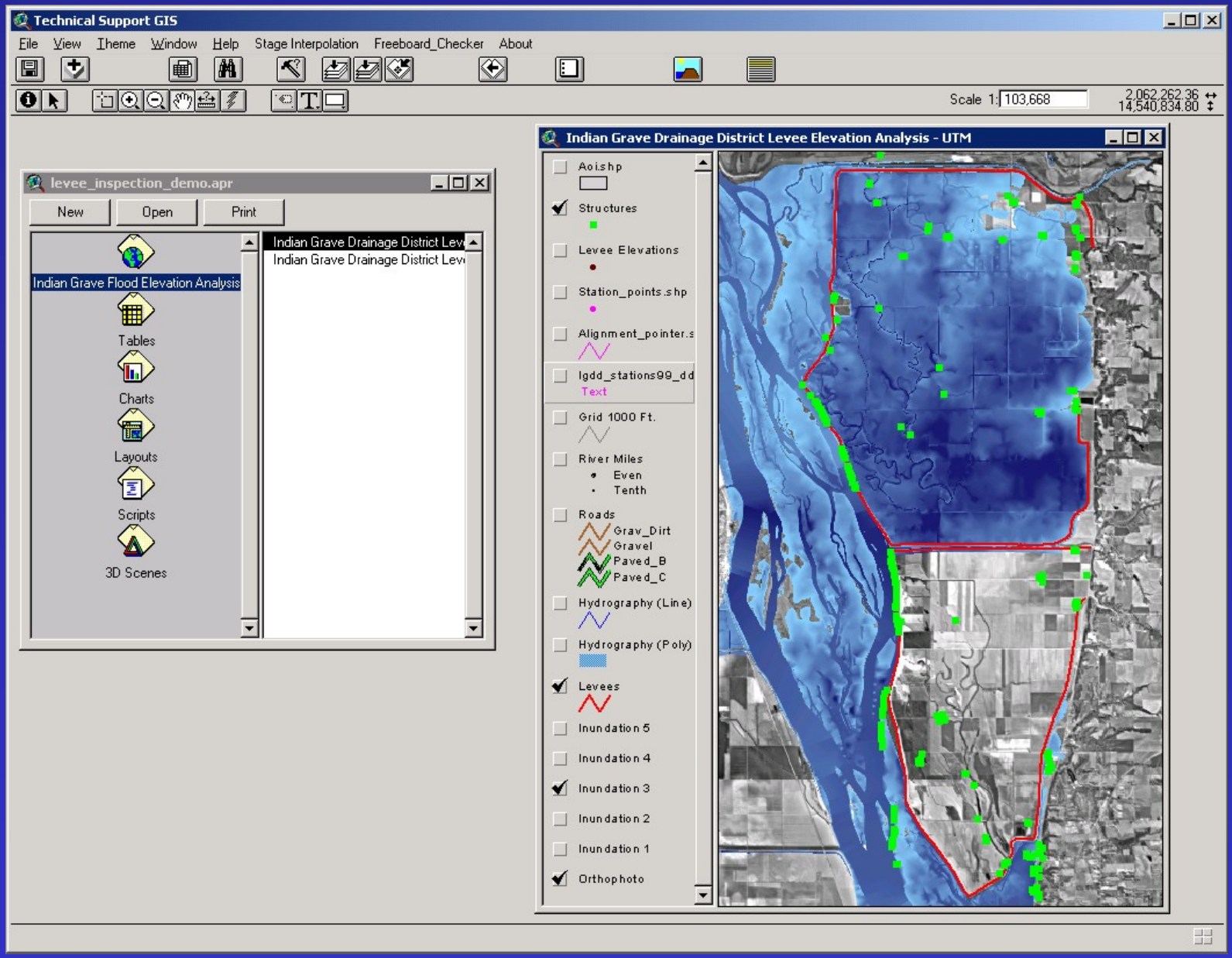


Benefits

- District cost savings due to the ability to perform rough damage calculations without detailed survey data.
- Accessible damage analysis for future land use scenarios.
- Tools to generate stage-area crop relationships will facilitate the use of the detailed crop damage computations being added to HEC-FDA.

GIS capabilities for damage analy

- Flood inundation mapping for event analysis
  - Post Flood/Forecasted Flood Damage Assessments
  - Urban & Agricultural Damage, Number of Structures & Population
  - Real-Time Maintenance, Warning and Response Activities
  - Benefits of Reservoirs and Levees
  - Declaration of Disaster Areas
- Flood inundation maps for risk analysis



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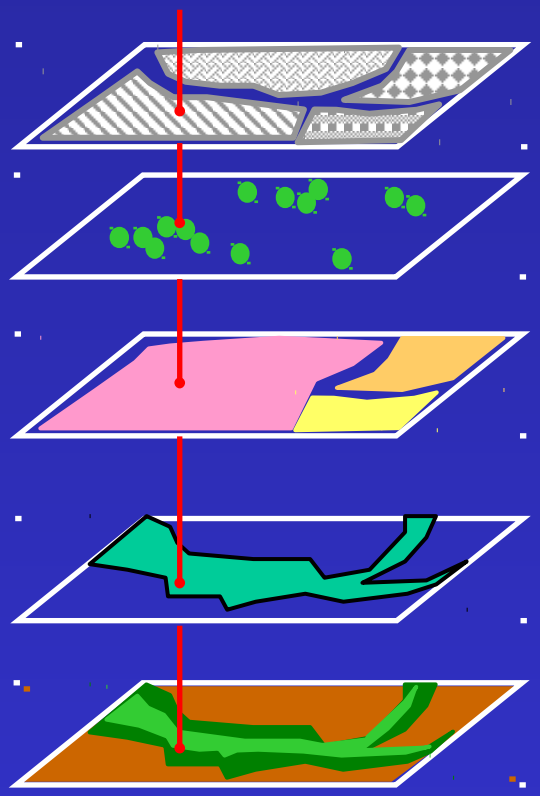
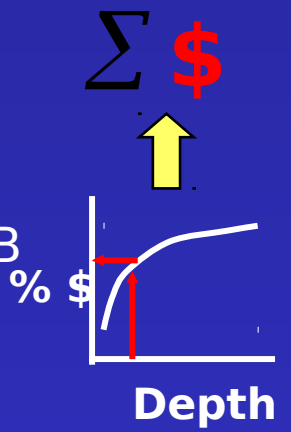
Damage Computations



Impact Area

Structure = APN11897
Struct. Occ. Type = SSNOB

Dam. Cat. = Residential

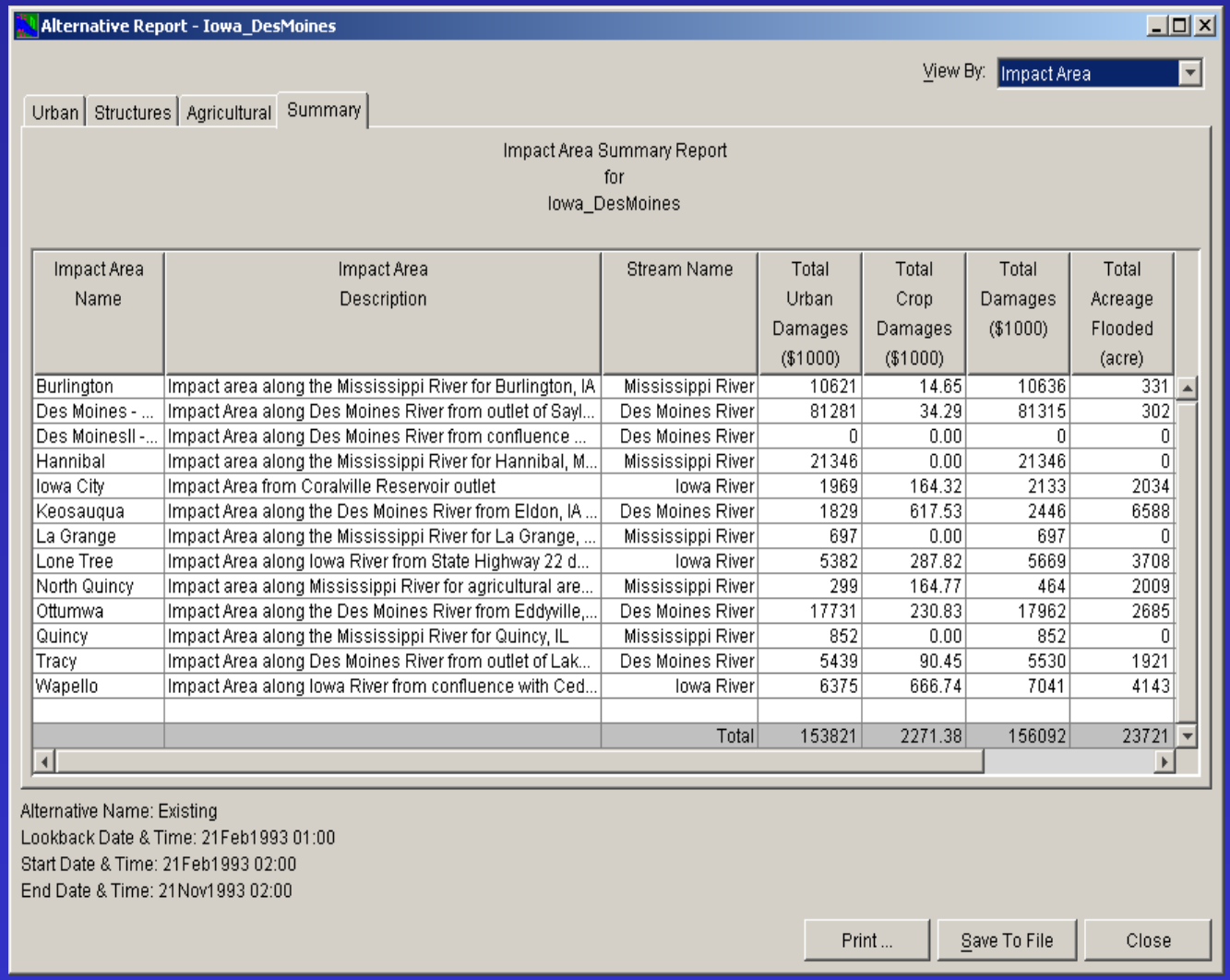


Water Elevation = 554 ft

Ground Elevation = 550 ft

Depth = 4ft

Damage Summary



Impact Area Name	Impact Area Description	Stream Name	Total Urban Damages ($1000)	Total Crop Damages ($1000)	Total Damages ($1000)	Total Acreage Flooded (acre)
Burlington	Impact area along the Mississippi River for Burlington, IA	Mississippi River	10621	14.65	10636	331
Des Moines - ...	Impact Area along Des Moines River from outlet of Sayl...	Des Moines River	81281	34.29	81315	302
Des Moinesll -...	Impact Area along Des Moines River from confluence ...	Des Moines River	0	0.00	0	0
Hannibal	Impact area along the Mississippi River for Hannibal, M...	Mississippi River	21346	0.00	21346	0
Iowa City	Impact Area from Coralville Reservoir outlet	Iowa River	1969	164.32	2133	2034
Keosauqua	Impact Area along the Des Moines River from Eldon, IA ...	Des Moines River	1829	617.53	2446	6588
La Grange	Impact Area along the Mississippi River for La Grange, ...	Mississippi River	697	0.00	697	0
Lone Tree	Impact Area along Iowa River from State Highway 22 d...	Iowa River	5382	287.82	5669	3708
North Quincy	Impact area along Mississippi River for agricultural are...	Mississippi River	299	164.77	464	2009
Ottumwa	Impact Area along the Des Moines River from Eddyville,...	Des Moines River	17731	230.83	17962	2685
Quincy	Impact Area along the Mississippi River for Quincy, IL	Mississippi River	852	0.00	852	0
Tracy	Impact Area along Des Moines River from outlet of Lak...	Des Moines River	5439	90.45	5530	1921
Wapello	Impact Area along Iowa River from confluence with Ced...	Iowa River	6375	666.74	7041	4143
		Total	153821	2271.38	156092	23721

Alternative Name: Existing
Lookback Date & Time: 21Feb1993 01:00
Start Date & Time: 21Feb1993 02:00
End Date & Time: 21Nov1993 02:00

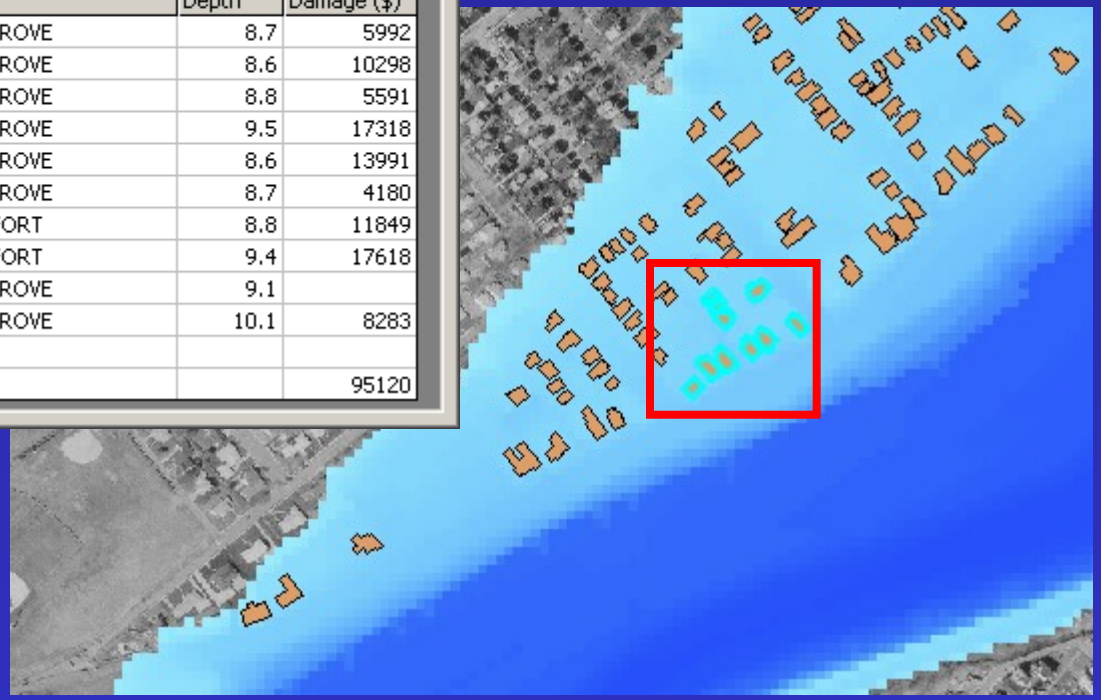
Print ... Save To File Close

Susquehanna Flood Warning System Philadelphia District

Flood Damage by Structure

Print ... Copy ...

Name	Address	City	Depth	Damage ($)
KRATZER KENNETH A	216 PINE ST.	SELINSGROVE	8.7	5992
SMITH RICHARD W	316 PINE ST.	SELINSGROVE	8.6	10298
DANCIK WILLIAM J JR	301 PINE ST.	SELINSGROVE	8.8	5591
DORMAN EDWARD L	222 WALNUT ST.	SELINSGROVE	9.5	17318
INCH KAREN S	205 WALNUT ST.	SELINSGROVE	8.6	13991
HOFFMAN ROGER K	217 WALNUT ST.	SELINSGROVE	8.7	4180
KERN JEFFREY P & KATRINA A	268 RIVER STREET	FORTY FORT	8.8	11849
GOWER BETTY JEAN & DONALD	290 RIVER STREET	FORTY FORT	9.4	17618
WITMER CHARLES A	118 THIRD ST.	SELINSGROVE	9.1	
IRANI PHIKOZA	300 S. FRONT ST.	SELINSGROVE	10.1	8283
Total =				95120



- Forecasted Inundated Area
- Stream Coverage
- Orthophoto
- Impact Area
- Structure Inventory
- Structure Occupancy Type

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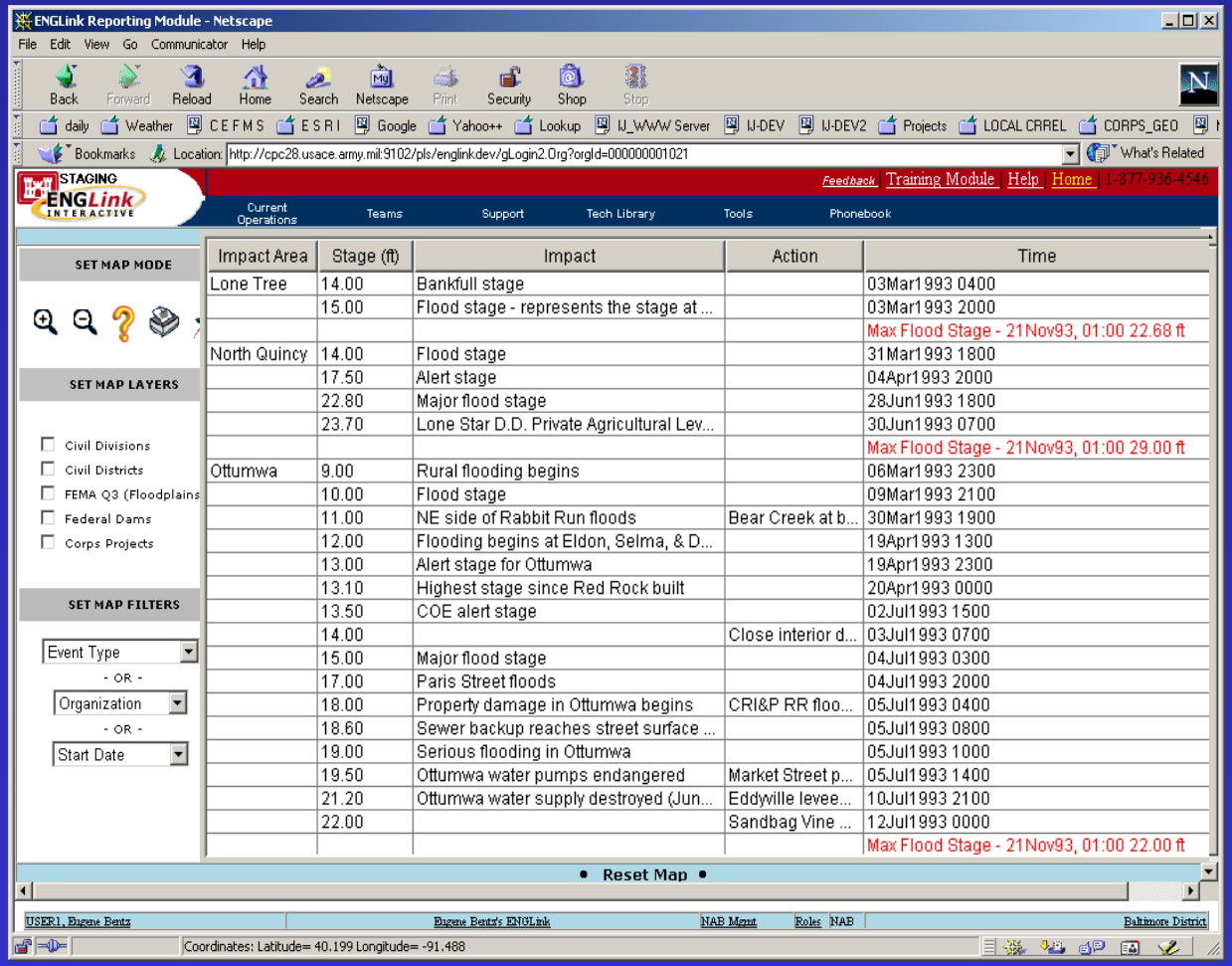
Real Time Impact Response Table

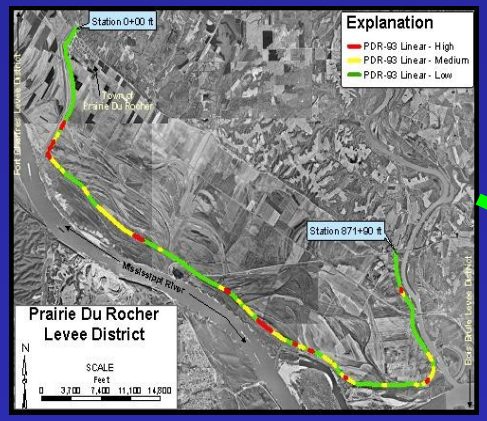


Impact Area	Stage (ft)	Impact	Action	Time
Lone Tree	14.00	Bankfull stage		03Mar1993 0400
	15.00	Flood stage - represents the stage at ...		03Mar1993 2000
				Max Flood Stage - 21Nov93, 01:00 22.68 ft
North Quincy	14.00	Flood stage		31Mar1993 1800
	17.50	Alert stage		04Apr1993 2000
	22.80	Major flood stage		28Jun1993 1800
	23.70	Lone Star D.D. Private Agricultural Lev...		30Jun1993 0700
				Max Flood Stage - 21Nov93, 01:00 29.00 ft
Ottumwa	9.00	Rural flooding begins		06Mar1993 2300
	10.00	Flood stage		09Mar1993 2100
	11.00	NE side of Rabbit Run floods	Bear Creek at b...	30Mar1993 1900
	12.00	Flooding begins at Eldon, Selma, & D...		19Apr1993 1300
	13.00	Alert stage for Ottumwa		19Apr1993 2300
	13.10	Highest stage since Red Rock built		20Apr1993 0000
	13.50	COE alert stage		02Jul1993 1500
	14.00		Close interior d...	03Jul1993 0700
	15.00	Major flood stage		04Jul1993 0300
	17.00	Paris Street floods		04Jul1993 2000
	18.00	Property damage in Ottumwa begins	CRI&P RR floo...	05Jul1993 0400
	18.60	Sewer backup reaches street surface ...		05Jul1993 0800
	19.00	Serious flooding in Ottumwa		05Jul1993 1000
	19.50	Ottumwa water pumps endangered	Market Street p...	05Jul1993 1400
	21.20	Ottumwa water supply destroyed (Jun...	Eddyville levee...	10Jul1993 2100
	22.00		Sandbag Vine ...	12Jul1993 0000
				Max Flood Stage - 21Nov93, 01:00 22.00 ft

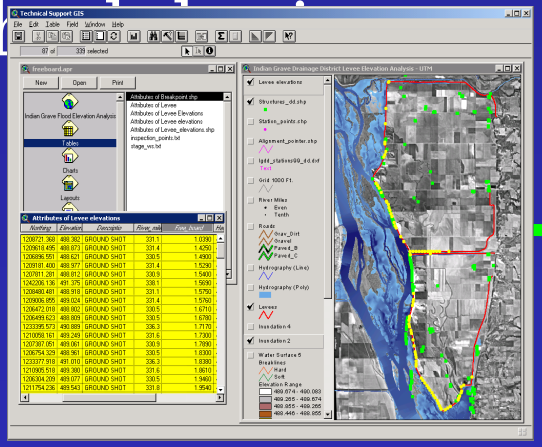
TOWNS

Integrated GIS & Modeling

Meth

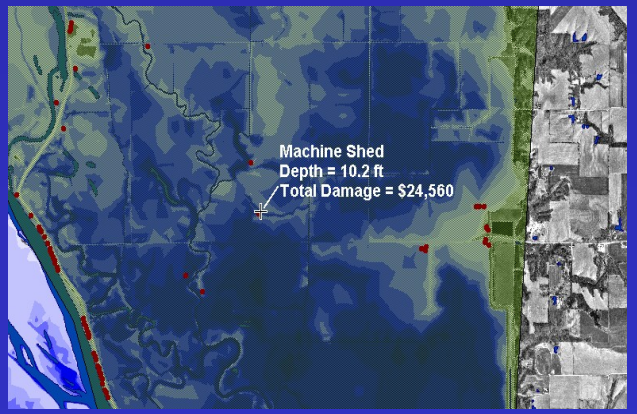


Geologic analysis data



Levee warning and scenario development

Real-time aerial and ground survey data



Flood response & damage comp

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Non-structural analysis

- Allow users to specify non-structural alternatives from an interactive GIS interface and compute revised EADs or event damages.
- Alternative sets can be saved as new structural inventories for complete risk analysis of the alternative.
- Will streamline the nonstructural analysis process and facilitate decision making.

Description of Work

- Non-structural alternatives
  - Flood proofing
  - Raising of structures
  - Relocation of structures
  - Ring Levees
  - Floodplain Management/Regulations
  - Flood Warning Preparedness Plans

Prototype Study: Cass River in Vassar, MI

US Army Corps
of Engineers
Hydrologic Engineering Center

Investigation of Non-Structural Flood Damage Reduction Alternatives for the City of Vassar, MI.

August 2002

IR-52

With the National Non-Structural/Flood Proofing Committee and Detroit District